Kolbe Academy
Home School

PRECALCULUS
HIGH SCHOOL MATH
Kolbe Core Level
Foerster Precalculus: Concepts and Applications, 3rd Edition

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Kolbe Academy Home School	♦ SYLLABUS ♦	Precalculus High School Math

COURSE TITLE: Precalculus

COURSE DESCRIPTION:

This course is a one-year course (10 credits) in high school Precalculus. Parents should preview the course plans to gain a better understanding of what this course entails.

The Kolbe Core (K) track, although left up to the parent's discretion, is recommended for any student who has successfully completed Algebra II (K) or Algebra II/Trig (H). If a student finds the work load unbearable, please contact the advisor department so that suggestions can be made for the student to succeed in this course.

COURSE TEXTS, RESOURCES, & MATERIALS:

- *Precalculus: Concepts and Applications*, Paul A. Foerster, © 2012, 3rd edition
- *Precalculus Parent/Instructor Material* –: registration instructions sent by e-mail upon purchase of textbook

  Provides access to:
  - PDF copy of textbook Solutions Manual
  - Graphing Calculator Programs
- *Math Without Borders* Foerster's Precalculus Home Study Companion w/Solutions Flash Drive, [optional]
- Programmable Graphing Calculator, preferably TI-83 or TI-84 model

SCOPE AND SEQUENCE:

Unit 1: Algebraic, Exponential, and Logarithmic Functions
1. Chapter 1- Functions and Mathematical Models
2. Chapter 2 - Properties of Elementary Functions
3. Chapter 4- Polynomial and Rational Functions

Unit 2: Trigonometric and Periodic Functions
1. Chapter 5 - Periodic Functions and Right Triangle Problems
2. Chapter 6 - Applications of Trigonometric and Circular Functions
3. Chapter 7- Trigonometric Function Properties, Identities, and Parametric Functions
4. Chapter 8- Properties of Combined Sinusoids
5. Chapter 9- Triangle Trigonometry

Unit 2: Analytic Geometry
1. Chapter 10 - Conic Sections and Quadratic Surfaces
2. Chapter 11- Polar Coordinates, Complex Numbers, and Moving Objects

Unit 4: Introduction to Discrete and Continuous Mathematics
1. Chapter 14 - Probability, and Functions of a Random Variable
2. Chapter 15 - Sequences and Series

COURSE PLAN "AT A GLANCE" OUTLINE:

Semester 1	Material Covered:	Exam Schedule:
Week 1	Chapter 1: 1-1 through 1-3	
Week 2	Chapter 1: 1-4 through 1-8	Chapter 1 Test
Week 3	Chapter 2: 2-1 through 2-3	
Week 4	Chapter 2: 2-3 through 2-6	
Week 5	Chapter 2: 2-8 through Chapter 4: 4-2	Chapter 2 Test
Week 6	Chapter 4: 4-2 through 4-4	
Week 7	Chapter 4: 4-5 through 4-7	
Week 8	Chapter 4: 4-9 through Chapter 5: 5-2	Chapter 4 Test
Week 9	Chapter 5: 5-3 through 5-5	
Week 10	Chapter 5: 5-6 through Chapter 6: 6-2	Chapter 5 Test
Week 11	Chapter 6: 6-2 through 6-5	
Week 12	Chapter 6: 6-6 through 6-8	
Week 13	Chapter 6: 6-9 through Chapter 7: 7-2	Chapter 6 Test
Week 14	Chapter 7: 7-2 through 7-4	
Week 15	Chapter 7: 7-4 through 7-6	
Week 16	Chapter 7: 7-6 through 7-7	Chapter 7 Test
Week 17	Semester 1 Review	
Week 18	Semester 1 Review	Precalculus Semester 1 Exam

Semester 2	Material Covered:	Exam Schedule:
Week 1	Chapter 8: 8-1 through 8-3	
Week 2	Chapter 8: 8-3 through 8-6	
Week 3	Chapter 8: 8-7 through Chapter 9: 9-2	Chapter 8 Test
Week 4	Chapter 9: 9-3 through 9-6	
Week 5	Chapter 9: 6-7 through 9-7	
Week 6	Chapter 9:9-8 through Chapter 10: 10-2	Chapter 9 Test
Week 7	Chapter 10: 10-2 through 10-4	
Week 8	Chapter 10: 10-5 through 10-8	Chapter 10 Test
Week 9	Chapter 11: 11-1 through 11-4	
Week 10	Chapter 11: 11-4 through 11-6	Chapter 11 Test
Week 11	Chapter 14: 14-1 through 14-4	
Week 12	Chapter 14: 14-4 through 14-6	
Week 13	Chapter 14: 14-6 through 14-8	
Week 14	Chapter 14: 14:8 through 14-9	Chapter 14 Test
Week 15	Chapter 15: 15-1 through 15:3	
Week 16	Chapter 15: 15-3 through 15-4	Chapter 15 Test
Week 17	Semester 2 Review	
Week 18	Semester 2 Review	Precalculus Semester 2 Exam

COURSE PLAN METHODOLOGY:

The ***Quick Review*** problems that appear at the beginning of the exercises with each lesson are meant to be completed in 5 minutes or less. Students should **not** write out all the steps neatly for these problems, but instead try to quickly write down the answer and move on. These problems are meant to recall concepts learned in previous sections, chapters or math courses. Overall, these problems will help a student to think quickly – a skill that is useful in taking standardized tests- and will assist the student in remembering useful mathematical tools learned in the past. These problems can be used as short, timed quizzes if desired.

A selection of exercises from the ***Problem Sets*** will be assigned with each section for the student to complete. A sufficient number of problems have been carefully chosen to help the student become proficient in a topic and prepare them for the Kolbe semester exams. The author's intent was not to have students complete all of the problems in the book, but to have a diverse number of problems available to the teacher. Most odd numbered problems are answered in the back of the student text. It is advisable for students to check their work as they go along in an assignment to be sure that they have understood the methodology of the section. The solution manual may be used by the student to check any even numbered problems. If additional work is needed, students may want to pick a few of the even numbered problems for further practice.

The ***Chapter Tests and Comprehensive Semester Exams*** may be found after the weekly lessons in this course plan. ***Answer Keys*** may be found after the Chapter Tests and answer keys and are to be taken at the end of each semester. A full two hours should be allotted for the student to complete Kolbe Academy's Semester Exams.

Students are expected to be utilizing a programmable ***Graphing Calculator.*** This skill is especially important now that the use of a graphing calculator is permissible on the math portion of the standardized tests including the SAT, ACT, and PSAT. The Kolbe Academy exams are set up specifically to hone testing skills with and without the use of the graphing calculator. Kolbe Academy has traditionally suggested the use of the TI-83 or TI-84 graphing calculator models. Graphing calculator programs required to complete problems are available for free to students and are accessed through the *Precalculus Parent/Instructor Materials*. If you did not receive an e-mail with a link to request this access please contact Kolbe Academy at homeinfo@kolbe.org, or at 707-255-6499 Ext. 5.

DIPLOMA REQUIREMENTS:

Summa Cum Laude diploma candidates are required to follow either the Kolbe Core course (K) course track outlined in this Calculus course plan. ***Magna Cum Laude*** and ***Standard*** diploma candidates may choose to pursue the (K) designation, but are not required to do so, and instead have the option of altering the course plan as they choose. ***Summa*** students must complete 4 years of mathematics during their high school course of study including Algebra I, Geometry, Algebra II, and Pre-Calculus (or higher). ***Magna*** students must complete 3 years of mathematics during their high school course of study including Algebra I, Geometry, and Algebra II (or higher). ***Standard*** diploma students must complete 2 years of mathematics including Algebra I. Please see below for specific course titles, semester reporting requirements and transcript designations for Precalculus and Precalculus (K).

REQUIRED SAMPLE WORK:

Designation*		**K**	**H**
Course Title	**Precalculus**	**Precalculus**	**Precalculus**
Semester 1	1. Any two written and graded samples of work	1. Completed Chapter 4 Test 2. Completed Semester 1 Exam	Please use the Honors level Precalculus course plan to receive the H designation.
Semester 2	1. Any two written and graded samples of work	1. Completed Chapter 10 Test 2. Completed Semester 2 Exam	

***Designation refers to designation type on transcript. K designates a Kolbe Academy Core course.**

If the student wishes to have the course distinguished on the transcript with a (K) as a Kolbe Academy Core course, please be sure to send the correct exams and components each semester for verification as specified above. **If no designation on the transcript is desired, parents may alter the lesson plan and any written sample work is acceptable to receive credit for the course each semester.** If you have any questions regarding what is required for the (K) designation or diploma type status, please contact the academic advisory department at 707-255-6499 ext. 5 or by email at advisors@kolbe.org.

Kolbe Academy
Home School

♦ COURSE PLAN ♦

Precalculus
High School Math

♦♦♦ FIRST SEMESTER ♦♦♦

WEEK 1	
♦♦♦ Chapter 1 ♦♦♦ **Functions and Mathematical Models**	
Students should spend 2 days on Section 1-3.	
1-1	Read Section 1-1. Do problems 1-5.
1-2	Read Section 1-2. Do 1-39 (odd), 40, 41.
1-3	Read Section 1-3. Do Reading Analysis, Q1-Q10; and problems 1-6 on day 1. On day 2, do problems 7-21.
Notes	

WEEK 2	
♦♦♦ **Chapter 1 Cont'd** ♦♦♦ **Functions and Mathematical Models**	
1-4	Read Section 1-4. Do Reading Analysis, Q1-Q10, and problems 1, 2, 5, 7, 9, 10, 12-15.
1-5	Read Section 1-5. Do Reading Analysis, Q1-Q10, and problems 1, 3-5, 7, 9, 13, 17, 18, 21, 25, 26, 29, 37, 38.
1-6	Read Section 1-6. Do Reading Analysis, Q1-Q10, and problems 1-4, 5, 7, 9-14.
1-8	Read Section 1-8. Do R1-R6.
♦♦♦ **Chapter 1 Test** ♦♦♦	
Notes	

WEEK 3	
♦♦♦ Chapter 2 ♦♦♦ **Properties of Elementary Functions**	
2-1	Read Section 2-1. Do Reading Analysis and problems 1-4.
2-2	Read Section 2-2. Do Reading Analysis, Q1-Q10, and problems 1-25 (odd).
2-3	Read Section 2-3. Do Reading Analysis, Q1-Q10, and problems 1-23 (odd).
Notes	